Chapter

Introductory Chapter: Mineral Deficiencies - Electrolyte Disturbances, Genes, Diet and Disease Interface

Gyula Mózsik and Gonzalo Diaz Soto

1. Introduction

This book, *Mineral Deficiencies - Electrolyte Disturbances, Genes, Diet and Disease Interface*, discusses mineral deficiencies in human nutrition. It is a follow-up to our previous book, *Nutrition in Health and Disease - Our Challenges Now and Forthcoming Time* [1], which detailed problems of malnutrition, starvation, economics, and society across four continents.

2. Early histological backgrounds of "scientifically approach to nutrition"

For more than 200 years, the fibre in plant foods has been known by animal nutritionists to have significant effects on digestion. Its role in human nutrition began to be investigated towards the end of the nineteenth century. Denis Burkitt (1911–1993), a surgeon, brought back to the United Kingdom from Africa ideas from a range of disciplines along with his own observations to propose a radical view of fibre in human health. Later, Burkitt met with three physicians in London, Cleave, Campbell, and Trowell, who collected observations on fibre consumption and the distribution of different diseases in Africa. Trowell worked in London at St. Thomas' Hospital and had visited Uganda in 1948, 1958, and 1970, and Kenya in 1929. He observed that the distribution of different diseases changed along with changes in the population during the observed periods. Namely, the numbers of different diseases increased in people who came from Western countries, whereas the numbers remained unchanged in the African populations. In addition, he noted the emergence of entirely new diseases like diabetes mellitus, hypertension, and malignant conditions in the population coming from Europe.

Burkitt built on the work of Cleave, Campbell, and Trowell to develop the "fibre hypothesis" [2, 3], the main point of which is that fibre consumption decreases the risks of obesity, diabetes, dental caries, various vascular disorders, large bowel cancer, appendicitis, and diverticulosis, particularly in the UK population. This hypothesis was considered groundbreaking at the time, and spurred further research (e.g., "Dietary Fibre in Europe. Current State of Knowledge on Definitions, Sources, Recommendations, Intakes and Relationships to Health." Nutrition Research Reviews. 2017;**30**:149-190).

3. Problems in nutrition research from 1970 to the present

3.1 Dietary fibre

The chemical compositions of fibres of different origin have been widely studied, as have their different behaviours such as viscosity, linkage capacity, detoxication abilities, and changes before vs. after treatments like heating, boiling, cooking, and so on [4].

To understand the actions of different foods, we must investigate their effects in healthy subjects as well as subjects with different diseases. For this, written and permitted protocols in accordance with guidelines from different national and international authorities and permission from persons who participate in the studies are required [4].

3.2 Metabolic wards in nutrition research

To correctly measure the actions of foods (given either orally or parenterally), the correct methodology must be used. As such, controlled dietary studies typically take place in metabolic wards. These wards must be fully equipped with the appropriate measuring instruments, staff (e.g., physicians, laboratory assistants, etc.), and study participants. Details of different accepted methods can be found in our previous book [5].

3.3 Chemicals and drugs in food

One of the biggest problems with foods for human consumption is the wide and systematic use of chemicals (plant origin food) and drugs such as hormones (animal origin foods). The aim of these systematic treatments is to increase crop and livestock yields.

My research team studied the effects of capsaicin (from paprika) on the so-called capsaicin-sensitive afferent nerves and compared its anti-inflammatory properties with those of nonsteroidal anti-inflammatory drugs (NSAIDs), which can produce mucosal damage, bleedings, ulceration, and of course stomach pain. Our results showed that paprika for human consumption contains anywhere from one to eight different pesticide residues (see The Report Card: Pesticides in Sweet Bell Peppers at www.ewg.org; [6], pp. 152–153).

3.4 Controls of our observations

We present the results of our population observations along with lists of agricultural chemicals used both in plants and animals, although we do not identify the individual treatments.

4. Conclusion

The field of nutrition is very wide, thus collaboration is necessary to investigate the different problems stemming from plant and animal foods before their arrival to humans. We must identify the main problems of industrial food factories, food storage, and more.

We all know that the world's population is growing exponentially, whereas the world's food supply is dwindling. Thus the possibility of malnutrition (starvation) is extremely high.

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Our responsibility lies in the production of better foods for the prevention and treatment of different diseases. We must work together and learn from one another, focusing our attention on problems of agriculture, climate, economics, medicine, and more.

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